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SCIENCE NEWS-LETTER

The Weekly Summary of Current Science

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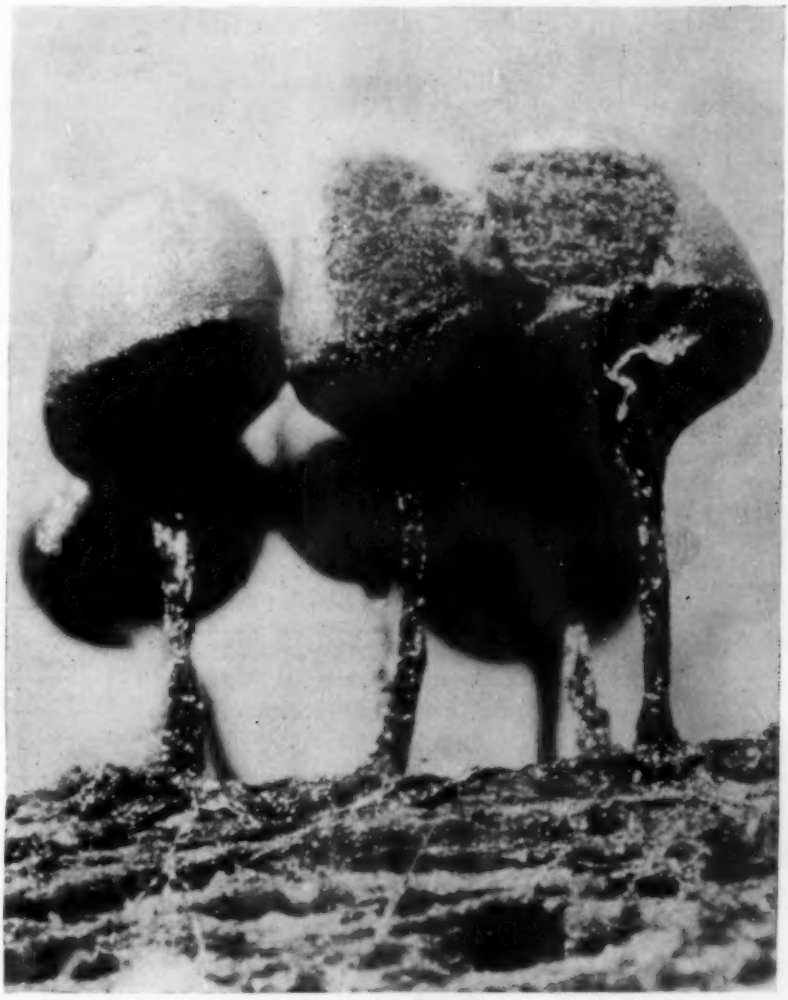

FOR A PLACE IN THE SUN

"Mushroom" Shape One of the Basic Plant Forms

(See page 330)

Vol. XVI No. 451

"Missing Link" Skulls Doubted

Evolution

Pithecanthropus, the "man of Java," and Eoanthropus, the "dawn man" of Piltdown, England, are looked upon with doubting eyes by Gerrit S. Miller, Jr., curator of mammals of the U. S. National Museum. In the annual report of the Smithsonian Institution, just off the press, he sums up all the arguments thus far advanced both for and against the recognition of these two extinct species as links between human and simian, and ends by remanding the case pending the discovery of further evidence. This is in direct opposition to the opinions of perhaps a majority of anthropologists, and certainly to the popular impression regarding these fossils which has come to regard them as unquestionably human, though resembling the apes more than modern man does.

After reviewing the fragmentary and scattered nature of the finds, and calling attention to the lack of certain parts that would solve the riddle if they could only be found, Mr. Miller concludes:

"Two facts, if no others, must be admitted to stand out from the maze of opinion which we have been trying to follow—namely, that these fossils have furnished an unparallleled stimulus to investigation, and that the things most needed now are more fossils and many of them. While awaiting these further discoveries we should not hesitate to confess that in place of demonstrable links between man and other mammals we now possess nothing more than some fossils so fragmentary that they are susceptible of being interpreted as such links or as something else."

Mr. Miller emphasizes that this does not imply a rejection of the evolutionary idea in general or as applied to the origin of man.

It merely means that in his opinion the collections of bone fragments under discussion cannot be regarded as certainly having pertained to creatures intermediate between man and some kind of ape.

The Java ape-man, or *Pithecanthropus,* was discovered in a river-gravel deposit at Trinil, Java, by a Dutch physician, Eugene Dubois, in 1891 and 1892. The find consisted of the top of the skull, three teeth and a thigh-bone. All scientists agree on one point and on one point alone. They regard the skull-cap as an entirely unique fossil, quite unlike anything else that has ever been discovered. But when it comes to interpreting this bone and the others associated with it, they disagree violently on no less than fifteen controversial points.

The discovery of *Eoanthropus* dates a couple of decades later than that of the Java ape-man. Like the *Pithecanthropus* remains, these fossils were found in gravel, at Piltdown, England. Search through several seasons turned up a number of scattered bone fragments representing two skulls, with part of the lower jaw and several teeth. Here again there is only one point of full agreement. All scientists are at one in stating that the skull fragments are genuinely human. But again when it comes to interpreting all the fragments found, they disagree on twenty points.

For these reasons Mr. Miller believes that scientists should not try to form definite conclusions from the material now in hand, but should suspend judgment until further search brings in additional fossils, especially of bones still missing.

Science News-Letter, November 30, 1929

In This Issue

Our speeding *universe,* p. 331—King Cotton may *move,* p. 331—Tropical diet *criticised,* p. 332—Biological *abstracts,* p. 332—Sky *mappers,* p. 333—New *Baking* powder, p. 335—Hinged wing for *safety,* p. 336—Atom *Romance,* p. 336—Plant *nerves,* p. 337—Moose *increase,* p. 337—Friends *wanted,* p. 338—New England *earthquake,* p. 341—*Pharaoh* did not "get drownded," p. 341—*Space,* p. 341—New *books,* p. 343.

For a Place in the Sun

Biology

The futuristic mushroom-like objects pictured on the cover of this week's SCIENCE NEWS-LETTER are not mushrooms at all, but the spore-boring bodies of one species of the lowest of all plants (or is it animals?), the Mycetozoa, as seen through the enlarging lens of Cornelia Clarke's camera.

The mushroom shape seems to be one of the first things a plant "thinks of" as a means for finding a place in the sun, or as in the present instance, a vantage-point in the air whence its spores may be launched. The simplest thing to do is just spread out flat, like a crustose lichen. The next simplest, when there isn't enough flat space left in the world and one must rise up and offer vertical surfaces as well as horizontal, is the sphere or one of its modifications, adopted by puffballs on land and also by no end of sessile marine animals.

Then come stalked structures, especially the stalked cone, adopted by mycetozoa, mushroom, algae and many animals.

There is a limit to the size attainable by a stalk-supported solid, or nearly solid, top. The difficulties of getting sufficient nourishment through the stalk, and of sustaining weight on top of it, keep the size down to a few inches at most. Hence various devices for maintaining the desirable shape while the size increases, serving the triple end of lightening weight, letting in air and increasing total surface. Mushrooms have gills, pores or teeth; vascular plants have branches and leaves. But all of them, up to the lordly *Sequoia gigantea,* repeat over and over again the basic shape-invention of their *n*-th degree ancestor, the slime-mould.

Science News-Letter, November 30, 1929

Moths are active all the year round in buildings where the temperature remains at 70 degrees Fahrenheit or higher.

The silk industry was kept within the borders of China in early times by a rigid restriction against exporting the silkworms or revealing the secrets of making silk.

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Solar System Rushing Through Space

Physics

The earth and the rest of the solar system are rushing at a rate of some six miles a second toward the portion of the sky in which is seen the constellation of the Dragon, Dr. Dayton C. Miller of the Case School of Applied Science, Cleveland, has discovered.

That there are at least twelve different experimental evidences of such a cosmic motion of the solar system is announced by Dr. Miller for the first time in a report to the National Academy of Sciences. Among these are the famous ether drift tests that he has been making for the past decade. This year's tests were made at Cleveland within 300 feet of the location of the original Michelson-Morley experiment on ether drift upon whose supposed negative result Einstein supported his theory of relativity. Dr. Miller, on the basis of a reinvestigation of the original test data and thousands of observations of his own on Mount Wilson and at Cleveland, concludes that the original experiment of 1887, cited in every textbook as proof that there is no ether, in reality shows the same sort of motion that he has found in his much more extensive repetitions of the experiment.

At present Dr. Miller has no theory to account for the cosmic effect he finds in his own experiments and the observations of others. But he urges scientists to consider the evidence that such cosmic motion is real and needs explanation. Moreover, he has found a periodic effect, detected by his interferometer, which is in accord with the theory of the experiment but which has never before been taken into account in the computing of the results.

In a wide variety of observations, Dr. Miller has found confirmation of his ether drift results. Independently, both the Berlin astronomer, Courvoirsier, and the director of the Paris Observatory, Esclangon, found peculiarities in the location of stars that can be explained by a motion of the solar system. The French astronomer also found evidence for the motion in observations of stars passing behind the moon, earth tides and ocean tides. By studying the reflection of light from a mirror, Esclangon found strong evicence for an "optical dissymetry of space" which can be explained by an ether drift. The direction from which the powerful cosmic rays come into earth from outer space was found by German scientists to agree with the idea of a motion toward the part of the heavens described astronomically as having a right ascension of 17 hours. And observations made by Americans on the non-magnetic ship "Carnegie" show a maximum cosmic ray effect from that direction.

Several mysterious discrepancies in more ordinary astronomical and physical observations, such as the constant of aberration, star places and clock corrections, can be explained by the existence of an ether drift, Dr. Miller said. All of these show a rushing of the sun and its family toward the part of the sky that can now be seen by facing north on a clear evening and looking about half-way up from the horizon. The astronomers designate that portion of the sky as about 16½ to 18 hours right ascension and about 60 degrees declination north. There shine the stars that seemed to the ancients to form pictures of the Dragon and Hercules.

In that direction our solar system, carrying us along, is headed if Dr. Miller's conclusions stand the test of time.

Science News-Letter, November 30, 1929

U. S. May Lose Cotton Supremacy

Agriculture—Economics

Cotton is still king in the Southland, but his throne is a bit uneasy under him, and in the course of a few years he may have to share domain with younger King Cottons who are growing up in other lands. This is the gist of a prophetic report to Economic Geography, by Prof. Earl C. Case of the University of Cincinnati.

The very factors that helped to establish the southern part of the United States as the leading cotton-producing area in the world are now helping in its decline, and in the rise of rival cotton regions. Our cotton belt is a compact block of fertile soil with a climate well suited to cotton growing. But the fertility of the soil is declining, and the climate has been as favorable to the enemies of cotton—boll weevil and the rest—as it was to the cotton itself. Bad years affect the whole area and may cut down the yield fifty per cent., because it is all in one place; whereas cotton lands elsewhere in the world, being cut up into smaller and scattered blocks, escape in most parts when disaster visits any particular point.

Another important factor that is threatening the supremacy of American cotton is the rise in the cost of cotton-farming labor in this country. Even though the negro and "poor white" labor of the South is among the worst-rewarded of all American agricultural work, its wage is still many times higher than that of cotton-field workers in South America, India, Egypt, the Sudan and China. And the northward migration of negroes that has been going on ever since the new immigration laws cut down the supply of unskilled laborers in northern industrial plants is seriously cutting into the rural population of the South.

The apparent determination of British cotton spinners and weavers to reduce the degree of their dependence on American cotton by increasing the quantities of the fiber grown "within the Empire" is another influencing factor. Great new cotton areas have been opened up within the past few years in India, in the Sudan and in Tanganyika; and the cotton fields of Egypt still have strong British connections in spite of the changed political status of that nation. South American nations, notably Brazil and Argentina, are making strong efforts to become at least partly self-dependent.

China, one of the greatest cotton markets of the world, now raises a great deal of low-grade cotton. Prof. Case believes that the Chinese farmers, though the world's most obstinate conservatives, may in time be persuaded to introduce improved varieties and to adopt improved cultivation methods. If and when that happens, China will need a great deal less of foreign cotton.

Science News-Letter, November 30, 1929

An apparatus known as the planchute lands entire airplanes as the parachute lands the individual.

Experiments show that a female oyster five inches long and four inches wide discharges 109,000,000 eggs.

Diet Increases Tropical Disease

Medicine

Too much starch and sugar, too few vitamins, and too little of fatty and proteid foods are found in the diet of tropical peoples. This faulty diet is reflected in the health of the people, Dr. Seale Harris of Birmingham, Ala., told members of the American Society of Tropical Medicine at their meeting in Miami.

"Ignorance and laziness are the chief reasons why the inhabitants of tropical America live largely on white flour, white meal, polished rice, dried fish, coarse tubers and white sugar products, because with a very little effort they could make their fertile lands produce a delicious and wholesome variety of foods," Dr. Harris declared, adding that the faulty diet was not confined to the poor classes alone in the tropics. Rich and poor alike devote themselves to raising the money crops of sugar, bananas, tobacco and coffee, with little or no farming of the protective foods, such as vegetables, fruits, grains, chickens and cattle, for home consumption.

The family diet is probably a predisposing cause of many of the tropical diseases, even when the latter are known to be caused by definite organisms, Dr. Harris said, citing the work of many scientists in support of this theory. He said he believed the food factor was important both in the number of cases and of the high death rate from all diseases that prevail in the tropics.

"It appears not unlikely that the ravages of malaria and hookworm may be reduced by improving the nutrition of residents in countries in which these diseases prevail," he stated. Following the theory that the prevailing faulty diet is a factor in the causation of certain tropical diseases, Dr. Harris outlined diets which might be used effectively in combating these diseases.

The liberal use of fresh fruits and vegetables with whole wheat flour and whole grain cornmeal bread was strongly advocated by Dr. Harris in the treatment and prevention of these diseases, including pellagra and sprue. He considers these foods of far more importance than yeast. Considerable difference of opinion among scientists and physicians still exists on this point, however.

The interesting fact that the diet of the poor in rural New York is almost identical with that of the poor in the rural South was brought out by Dr. Harris.

"There were no cases of pellagra found among the poor in a New York rural community who lived on practically the same unbalanced, vitamin-deficient diet as is eaten by the poor in the South," he said. "Nor were there any cases of sprue in New York, yet the diet was as unbalanced and as deficient in vitamins as that of the poor and rich in Porto Rico where sprue is prevalent. Note also that in New York the disease which was found among the undernourished individuals was tuberculosis, a disease due to a pathogenic organism that is well known, i. e., the bacillus of tuberculosis, and that while malnutrition is no doubt a predisposing cause of pellagra and sprue, their specific origin has not yet been discovered, at least not to the satisfaction of many clinicians who have had a large experience with those diseases that prevail in some—not all—tropical and subtropical countries."

Science News-Letter, November 30, 1929

Summarizes Biological Literature

Biology

Biological Abstracts is just completing its second volume, Dr. Frederick V. Rand, associate editor, recently announced in the new French learned journal *La Coopération Intellectuelle.*

Designed to make the gist of all new biological announcements in any language available to scientists throughout the world, Biological Abstracts boils down and digests the contents of some 4,000 scientific periodicals, and will soon expand the list to 6,000. The first volume contained 1,289 pages, giving abstracts of 14,506 scientific articles. The present volume, now nearing completion, will be even larger than this.

The task of getting all the new biological knowledge of the world into smaller-than-tabloid form occupies the full time of a considerable staff of editors whose main headquarters are at the University of Pennsylvania, Philadelphia, with a branch office at the U. S. Department of Agriculture, in Washington. In addition to these, there are some 3,500 collaborators scattered all over the world, who look over and condense the contents of the scientific magazines and books that are assigned to them.

Biological Abstracts serves as successor to several similar but smaller abstracting journals published both in the United States and abroad. It received its first financial support from the Rockefeller Foundation and the Chemical Research Foundation. Beginning this year, it has received also an appropriation of $10,000 a year from the Federal government, which makes possible the new branch office in Washington. It is assisted also by the cooperation of the National Research Council and of a number of other scientific and educational institutions, both foreign and American.

Science News-Letter, November 30, 1929

Hailstorms are frequent and severe in sub-tropical regions and are rare in the coldest parts of the earth.

The average motorist in the United states spent $293 last year in operating and keeping up his car.

Rats Harbor Typhus

Public Health

One more just cause for war on the rat and mouse may be seen in the suggestion made by the U. S. Public Health Service that these rodents are a reservoir of deadly typhus fever.

Typhus, or jail fever, as it was once called, has always existed in mild form in countries of the Old World and in Mexico, but only lately it has been found almost constantly in cities in this country. Occurring in mild form, only one or two cases at a time, it is nevertheless a cause for concern because of the ever-present possibility of its flaring suddenly into an epidemic of a severe type.

"The typhus which has been occurring in our eastern seaports does not depend upon direct importation from across the sea. It belongs to the North American continent," reported the U. S. Public Health Service.

In the Old World, man has been the principal reservoir of the disease, and the human louse the principal carrier. In this country, however, the rat and mouse and possibly other rodents are being implicated as the reservoir of the disease, with fleas, mites or ticks as the most likely carriers.

Science News-Letter, November 30, 1929

Sky Mappers of the Alaska Aerial Survey

Aviation—Cartography

By James Nevin Miller

Ten thousand feet above a certain section of picturesque Alaska, where landing fields are rare and waterways are treacherous, four Navy planes maneuvered the other day. Not a whit dismayed by the fact that for miles around there was nothing to be seen but high mountains covered with dense forests, and towering glaciers with surfaces of glass-like slipperyness, the pilots circled about until they found what they were seeking—a winding waterway, whose flowing current was not quite as swift as its neighbors. Whereupon, swooping low, in swiftly executed movements, the planes moved like one in a graceful landing.

A solitary scientist of the U. S. Geological Survey, who had been watching the maneuvers with the utmost interest, hailed one of the pilots as he was setting foot on a sandy beach preparatory to moving his craft to a desirable position, and queried: "Just who are you boys and what are you doing so far away from civilization?"

The flyer pointed to a sign on his plane that read: "Alaskan Survey, U. S. Navy". Then he replied: "These four ships comprise our entire airplane equipment, but we have a whale of a lot of fun and do quite a bit of mapping."

For two seasons the government has had a group of Navy planes in the wilds of southeastern Alaska for the purpose of surveying the vast resources of the country by means of the aerial mapping method. Cooperating in the project are four important government bureaus: the Naval Bureau of Aeronautics, the Geological Survey, the Forest Service, and the Bureau of Public Roads of the Department of Agriculture.

To say that the results have been gratifying is to underestimate the situation. In 1926, the very first year, 10,000 square miles were surveyed, while since then the all-seeing eyes of the aerial cameras have blocked out in scientific fashion an almost equal mileage, hitherto unknown, containing lakes, streams and other topographic features whose value to American industry is well nigh inestimable.

For instance, it is no exaggeration to point out that the corps of "flying surveyors" has been largely responsible for the discovery of a new Alaskan industry—paper-making. The Tongass National Forest, lately mapped with

FORMATION OF PLANES far above the clouds

a high degree of thoroughness, is said to contain enough newsprint pulp to supply 25 per cent. of the needs of the United States indefinitely. Moreover, there recently has been located a power site of more than 20,000 horsepower. It is also in the Tongass Forest, on the east side of Taku Inlet near Greely Point.

In thus furthering their original objective and bettering it in a variety of ways, members of the Aerial Survey have had to do a lot of pioneering in respect to finding efficient methods of procedure. However, they have been exceedingly fortunate in their original choice of the amphibian type of plane. It has been maintained in regular use because of its ability to land on the water, and by careful manipulation of the landing gear, to taxi onto the beach, thereby enabling the ship to be secured and sheltered in some selected spot. The wisdom of this choice of plane has been borne out on numerous occasions when terrific storms would sweep down the narrow channels and blow with such force as to wreck any seaplane that happened to be moored in the water.

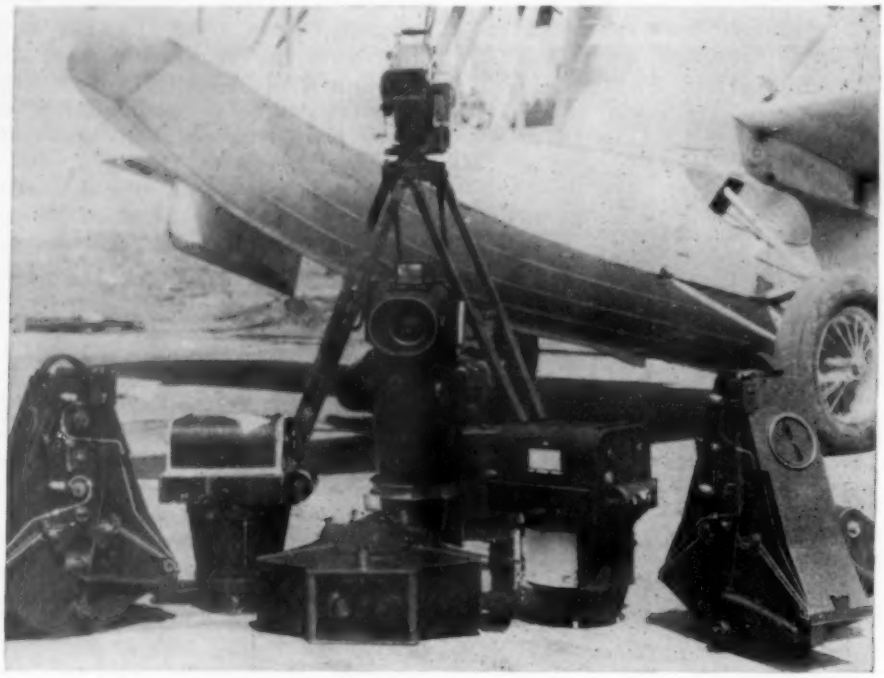
There are, of course, a good many places where planes cannot land or take off with impunity, and for this reason the U. S. S. Gannett, a mine sweeper which originally served as aircraft tender for the Navy Aircraft Squadrons, has been employed as tender for the Aerial Survey. Very few alterations were found necessary to prepare this vessel for her new duty. Prior to the assumption of her first task she had been fitted out with an extension boom enabling her to hoist a plane from the water and stow it on her stern.

The average person would hardly suppose that up in the great "north countries" the most modern comforts of home would be available for the "flying surveyors". But harken to their novel kind of domicile! A mammoth wooden barge, some 110 feet long and 40 feet wide, equipped with a towing bridle and anchoring gear, so that the craft might be pulled to convenient points by the tender, has been made over into living quarters for the 40 enlisted men and five officers of the Survey detachment. Electric lights are provided by a small lighting system, hot and cold water are available through the medium of a sizable water heater, and there's even a completely equipped photograph laboratory aboard, besides a space set apart for the overhauling of disabled planes.

Another unique part of the regular equipment is the supply of aerial cameras. Besides a motion picture outfit, utilized this past summer for a complete history of the season's activities, there have been available three multiple-lens cameras, one of which is a tri-lens affair and the other two equipped with four lenses. Just how these cameras are used is explained graphically by W. L. Richardson, Navy photographer:

"Three of the planes have been fitted with a special camera hatch located in the hull immediately below the rear cockpit. Here are installed the cameras used to take the oblique type of pictures so important in mapping observations. The T-2 or four lens camera, has met our most rigid tests. In ordinary mapping practice with a single lens camera of 12-inch focal length the flying photographers usually find 10,000 feet the best altitude. However, it was soon found that with this camera the usable area of each picture for mapping purposes was ordinarily less than a single square mile, at a scale of about 830 feet per inch. However, by employing the T-2 camera under like conditions, the Navy experts achieved a usable area of four square miles for each simultaneous exposure at a scale of about 1,550 feet per inch. Then, too, in the case of the single lens camera used at the customary elevation an area (*Turn to next page*)

Sky Mappers of the Alaska Survey—*Continued*



MANY CAMERAS, both still and motion picture, are needed in the work of mapping

only slightly over a mile wide is covered on each photographic strip, while with the T-2 camera an area over six miles wide is taken in.

"This of course greatly reduces the amount of flying time required in mapping any extended area. Moreover, the increase in width of ground area covered is gained, in the T-2 camera, by the use of two side chambers with their optical lenses pointing obliquely to left and right of the optical axis of the lens of the central vertical chamber. By this means two oblique photographs are secured which cover a ground area adjacent to left and right of the area photographed by the central chamber. The fourth is mounted in such a way that it covers an area that lies adjacent to, and to the rear of, the area covered by the central chamber. The purpose of this fourth chamber, then, is to greatly increase the accuracy with which the vertical and side views may be oriented by the map experts into a mosaic map, made by piecing the four sections together in painstaking fashion, after careful check-ups with ground data."

The fourth plane of the detachment has been converted into a sort of radio and meteorological laboratory, receiving weather reports on the wing from Navy radio stations in the region and preparing a weather map for charting the mapping planes. The work of this plane has proved indispensable to the success of the mapping maneuvers. Fog and low visibility may develop at any moment in the Alaska wilds.

Ever since the beginning of the Survey, Juneau has been regarded as a central base for the plane operations. However, the practice has been to utilize various lesser bases, depending on what the next mapping objective happened to be.

Some of the more important incidents and accomplishments of this past summer are described by Lieut. Commander Arthur W. Radford, officer in charge: "On June 14, two of our planes, one equipped with radio, made a flight from Petersburg along the mainland south of Wrangell for the purpose of taking mapping photographs. Mr. B. F. Heintzelman of the Forest Service accompanied us on this expedition as well as on another the same day along the eastern coast of Baranof Island. Upon the conclusion of the latter flight he stated that he learned more about the topography of Baranof Island from his observations on that day than he had been able to discover from ground observations there over a period of ten years."

A humorous incident well worth the telling took place early in the summer, Lieut. Commander Radford says. "While inspecting beaches on Japonski Island not far from Sitka in the hope of finding a good place to use as a temporary base for a few days, we were assured by the Secretary of the local Commercial Club, one Mr. Panamarkoff, that he had found just what we were seeking. Whereupon three of our officers were taken on an inspection tour of the beach in question. One of them remarked that it seemed a wee bit soft, but that did not phase the driver of the car in which they were riding. In order to prove the strength and hardness of the beach he made a sudden turn that put the car into the water about 15 feet from shore.

"Now the automobile came to a sickening stop. However, the motor was again started and after three attempts to pull out, the rear axle hit the extremely soft gravel. Meanwhile the tide was coming in with about a four foot rise yet to make. Repeated efforts to budge the truck failed, and shortly a truck was brought to the scene, and a towline hitched to the disabled car. But not a trifle did she budge! The close of this sad story is that the truck was finally left to the mercy of the incoming tide. Needless to say, we did NOT select this place as a temporary base for our planes."

Aside from their great importance for mapping purposes, the amphibian planes have been of considerable value as emergency modes of travel for high-ranking officials of the various government Bureaus and occasionally, for certain commercial interests. For instance, on a recent occasion a plane made a flight from Juneau to Petersburg and return, at the request of Major Elliott, president of the Alaska Road Commission, with Major Gillette, Corps of Engineers, U. S. A., as passenger. Major Gillette is chief engineer for the Road Commission and his visit to Petersburg was for the purpose of inspecting strategic dredging operations in Wrangell Narrows. A few days later a letter of thanks was received by the detachment from Major Elliott expressing the conviction that the aerial survey had enabled the Commission to settle immediately a question of great importance connected with the dredging maneuvers.

Some days afterwards, at the request of the Forest Service, a flight was made over Admiralty Island and the Speel River District with a Mr. Robert A. Kinzie as passenger. Mr. Kinzie is the chief (*Turn to next page*)

New Baking Powder Leaves No Residue

Chemistry

A baking powder which does not leave a residue in the finished bread or cake has just been worked out in the chemistry laboratories at the University of Wisconsin by Edwin O. Wiig. This new leavening agent has as its active agent acetonedicarboxylic acid, which during the baking process disappears entirely as gases.

The formation of carbon dioxide, the gas which "raises" the cake, is only part of the story of baking powder. The other part concerns the product which remains in the cake as a residue. The various commercial baking powders on the market at present leave as residues saline cathartics, such as sodium tartrate, Rochelle salt, disodium phosphate, sodium sulfate or aluminum hydroxide. There is still a question as to the possible ill effect of some of these materials upon health. Hence the advantage of a baking powder which leaves no residue whatsoever. Acetone is the only other substance formed besides carbon dioxide, and the acetone completely evaporates at baking temperatures.

The new powder depends for its action on combination with the water of the dough, just as do the present powders. Hence in order to protect it from atmospheric moisture it is mixed with starch. This cornstarch has a second function, more important than that just mentioned. Starch makes it possible for the chemist to standardize his product. All baking powders much have approximately the same "raising" strength to make possible the use of any recipe. The housewife-consumer will not consult the label of her tin of baking powder, and then compute whether the "two tsps. b.p." of her recipe should be doubled or halved. Starch takes care of any variation in the amount of carbon dioxide given off by active agents of differing compositions.

The keeping properties of acetonedicarboxylic acid baking powder are excellent, as Mr. Wiig has shown by various tests. It needs only to be kept in the customary moisture-proof tin. The keeping power of a product is of utmost importance to the manufacturer.

Further study of the suitability of acetonedicarboxylic acid as a leavening agent is being continued at the University of Wisconsin. The question of a cheaper source of raw material is still under investigation. At present citric acid is the raw material used in the making of acetonedicarboxylic acid. Cull lemons form the natural source of citric acid, and is the principal one in use. A shorter name for the substance would also be highly desirable, but that is a simple problem.

Science News-Letter, November 30, 1929

Sky Mappers of Alaskan Survey—*Continued*

consulting engineer for certain pulp and paper interests planning to build large paper mills in southeastern Alaska with an investment running into millions of dollars. For the first time Mr. Kinzie was able to get a bird's eye view of the timber concessions belonging to his employers, which are estimated as sufficient to supply their mills with pulp timber for at least 50 years.

A flight begun August 1, is believed to be one of the most important during the entire three years of operations. Two ships made mapping tours over Kruzof and Chichagof Islands while another plane made a six hour and 45 minute flight along the mainland to the northwest of Mount Fairweather. This was the longest single flight made by any plane in the detachment. The same afternoon a formation flight, carrying Dr. F. S. Smith and B. D. Stewart, executive officers of the Geological Survey, as passengers, was made over Taku Glacier and back again. Upon the return from this expedition a record was established by the tender Gannett, it is believed, in hoisting the four planes aboard the dock, although no special attempt was made to speed up operations. Thirteen minutes from the time the first plane of the formation touched water, the last plane landed on the dock. The Gannett's hoisting gear was designed for reliability rather than for speed, so that the fact that it worked so well indicates the efficiency of her officers and crew.

At the close of his trip to Taku Glacier, Dr. Smith, in a letter to Commander Radford, officer in charge, said: "In quitting you and your associates of the Alaskan Aerial Survey Detachment, I want to record my admiration of the work you have accomplished and the valuable contribution you have made to the development of the north country. We of the Geological Survey recognize the immense value of the photographs you are making in all phases of our natural resources investigations, and I now realize the effectiveness of the airplane as a means of transportation and observation for the geologist and engineer."

On August 10, two planes of the detachment with Mr. B. F. Heintzelman of the Forest Service and Mr. R. H. Sargent of the Geological Survey, as passengers and observers, made a flight over the Taku River District to investigate the water power possibilities of three lakes recently discovered by the planes from photographs taken by the experts. That the discovery of these lakes has given new impetus to the development of the paper and pulp industry in southeastern Alaska is indicated by the following front page story published by the *Alaskan Empire* of Juneau:

"The discovery of a lake by the Naval Alaskan Aerial Expedition capable of hydro-electric horsepower throughout the year, was announced today by E. F. Heintzelman, assistant district forester. It is located on the east shore of Taku Inlet, between Greely Point and Jaw Point, about two and a half miles from the beach. The discovery was made by Lieut. Commander A. W. Radford, flying one of the Naval Planes. It was apparent as soon as the photographs were developed that it was not shown on any existing maps and was hitherto unknown. The importance of the find in connection with the establishment of a pulp and paper mill here was emphasized today by Mr. Heintzelman. Both Mr. Heintzelman and Mr. R. S. Sargent flew over the lake and inspected the region as thoroughly as was possible from the air. Commenting on the find, Mr. Heintzelman said: 'This one discovery alone, in my opinion, far outweighs in value the total cost of all the aerial surveys made in southeast Alaska.'"

Navigators estimate that winds blowing along the seacoast of the Alaskan Peninsula in summer sometimes have a velocity of 80 to 100 miles an hour.

Science News-Letter, November 30, 1929

Hinged Wing Marks Contest Airplane

Aviation

By Capt. Thomas Carroll

The Cunningham-Hall airplane entered in the Guggenheim Safe Aircraft Competition is an ingenious craft.

The little airplane is designed around the very unusual Hall wing. This wing is one in which the normal contours are maintained when in normal flight, but for slow speed operation by means of a manual control the rearward half of the wing is hinged and turned down to a large angle of attack. This gives a condition of increased camber, but in addition to that a long opening on the underside of the front part of the wing is uncovered, which permits air to flow through the inner part of the wing, and is discharged across this downward flap to the rear. It has then the doubly effective advantage of both increased camber and boundary layer control, which insures a maintenance of high lift in the slow and high angle of attack condition.

Complete test information on the airplane is not yet available, due to the fact that it was finished in the Rochester factory only a day or two before the close of the acceptance of entries in the competition. It was necessary to curtail the brief period of factory flight tests, and to dispatch the airplane cross country to Mitchel Field. Unfortunately, while on this cross-country trip, the engine, which incidentally was not of American manufacture, broke a crankshaft and blew off its propeller. The pilot even in that difficult position and finding himself with only small fields available, was able to make a landing in a very restricted area entirely without further damage to his airplane. With the closing of the competition less than 24 hours off, the airplane had to be disassembled and brought to Mitchel Field by motor truck, where it is now reassembled and having a new engine fitted for its tests.

It is a biplane, or probably more correctly, an inverted sesqui-plane, in which the Hall wing as described above forms the lower wing, and it is not equipped with ailerons or lateral control devices. The upper wing, which is of very much less span and of extremely small chord, is almost entirely aileron.

The performance of the Cunningham-Hall will be watched with considerable interest, and it may prove to be a very serious contender.

Science News-Letter, November 30, 1929

Helium Heart's Affinity

Physics

A story of chase and capture in the submicroscopic world of physics was related by Prof. Bergen Davis of Columbia to the National Academy of Sciences.

Electrons excited and speeded by an electric field were made, in experiments performed by Prof. Davis and his associate, A. H. Barnes, to pursue the hearts of helium atoms, known as alpha particles shot out by radioactivity at a velocity of 9,000 miles per second. The objective was to make a helium nucleus seize and hold one or two of the electrons chasing along near it.

Only when the electron was in just the right condition of velocity, was it captured and the velocities of capture corresponded to the energy levels of the electron satellites of the atom as pictured by physicists.

In one of the experiments the speedy electron and receptive helium nucleus were placed close together for so short a time that the electron could not have had time to fall by gravitational attraction like a meteorite pulled to earth by the force of gravity. Yet the electron was captured and this caused the experimenters to wonder if the alpha particle or the electron or both might fluctuate in size, becoming very large when they are about to unite and becoming exceedingly small at other times. The auras or spheres of influence would in this event change with the energy of the particles.

This new light on the behavior of the nucleus of the helium atom in making electrons its own is considered a step toward better understanding of the constitution of this important building block element. Helium, useful as a gas for airships, is interesting to chemists because it is made of four hydrogen atoms and is itself the fundamental stuff for other atom building.

Science News-Letter, November 30, 1929

Child Habit Clinics

Psychiatry

The United States has 350 cities in 36 of its states where there is at least one habit clinic to which problem children may go to have their troubles understood and adjusted, the U. S. Children's Bureau has found as a result of a check-up on the increase in these child-guidance institutions. The Bureau has just issued a pamphlet directory listing the 500 psychiatric clinics for children in this country, thus showing the available resources in any given locality.

It is only 20 years ago that the first clinic for the study of delinquent children was set up in connection with the Chicago juvenile court, Miss Grace Abbott, chief of the bureau, stated in comment. The number today is still insufficient to meet more than a small fraction of the needs of delinquent children and the needs of the children who are serious failures at school or suffer from timidity and other personal handicaps.

Science News-Letter, November 30, 1929

Diet Aids Breeding

Zoology

Sables and martens, whose pelts are among the most highly valued of all furs, have been bred successfully in captivity at the Moscow Zoological Park. The present experiments have succeeded where others failed because the animals were given as near an approximation as possible to the rich and varied diet they get for themselves in the free forests, rather than the limited and more or less unnatural rations customary in zoos.

Under natural conditions these small carnivores feed largely on birds and small animals, making a special tidbit of bird brains. The lecithin, which brains contain, seems to be essential in reproduction, and the ordinary zoo diet is poor in lecithin. The ration in the Moscow experiments consisted of hens' eggs, calf brains and liver, to which common sparrows were added.

On this rich food the sables and martens mated and produced good litters. During pregnancy the females required an especially high lecithin ration, getting as many as four sparrows and nearly an ounce of brains a day.

Some new facts about the life history of these animals were learned from the breeding experiments. The period of gestation is much longer than was originally supposed, being nine or ten months in the case of sables and a little over seven and one-half months with martens. Sables mate in June or July instead of in January, as formerly supposed, and the mating of martens occurs in July.

Science News-Letter, November 30, 1929

Moose on Increase in Sweden

Zoology

The moose, usually called "elk" in Europe, is rapidly increasing in Sweden, under the protection of strict game laws. This year's brief open season of four days has just drawn to a close, and the preliminary reports indicate that approximately 3,500 animals were killed, as compared with 3,700 in 1928.

This protective legislation has, however, not proved wholly popular with farmers and foresters in certain parts of Sweden, because the moose is causing some damage to the crops and the young trees. Moreover, the moose, which was formerly a shy and elusive animal, has recently become extremely bold and in some cases ferocious. They are not easy to drive away from fields and gardens and in some instances they have attacked the farmers who tried to protect their crops.

The influence of civilization has also been harmful to them, as in the case of "Jeppe," a young moose that became so domesticated that it lived for years around a little village in northern Sweden. It went from house to house begging food, like a dog, and when it at last was turned back to the forest to join its wild brethren, it was unable to cope with the life in the open and was discovered shortly afterwards dead from starvation.

That even the monarch of the Swedish forests can at times bring forth abnormal specimens, is shown by the fact that a hermaphrodite moose was killed this year in Vaester Faernebo in the province of Vestmanland. It had the shovel-shaped horns of a bull, but other characteristics were those of a female animal. Last year another strange moose, a pure albino with pink eyes, was killed in Sweden, the first in more than twenty-five years. It was later mounted and is now exhibited at the Museum of Natural History in Stockholm.

Science News-Letter, November 30, 1929

Plants Show Nerve-Like Currents

Biology

New evidence for the physiological unity of plant and animal protoplasm was laid before the meeting of the National Academy of Sciences by Dr. W. J. V. Osterhout of the Rockefeller Institute. Dr. Osterhout has detected, by means of exceedingly delicate electrical apparatus, electrical variations in the comparatively enormous cells of the water plant *Nitella*. These variations resemble the action currents of animal nerve and muscle in form and magnitude.

The cells of *Nitella* are peculiarly adapted for experiments of this kind. They are very slender, but are often as much as six inches long. Their protoplasmic content is continuous, with many nuclei scattered throughout, instead of being divided up into numerous tiny cells each with a single nucleus, as is the case with most plants.

Science News-Letter, November 30, 1929

Quantum Theory Wins

Physics

Quantum mechanics, one of the latest developments in physics, won another victory over the older ideas of physics when Dr. Philip M. Morse of Princeton and the Bell Telephone Laboratories reported to the National Academy of Sciences that the quantum mechanical theory of the electron, the particle of matter and electricity, explains not only the general effect of scattering of electrons when they are shot at crystals, but also small peculiarities in the experimental results that appear when electrons are considered to be just like X-ray beams in their action.

Science News-Letter, November 30, 1929

Have More Nerves

Neurology

Negroes have larger nerve trunks and more numerous nerve-bundles within them than have white men. This is indicated by a recently completed study of Dr. H. Ide, as reported by Dr. Henry H. Donaldson of the Wistar Institute, Philadelphia, speaking before the meeting of the National Academy of Sciences. The study was conducted on nerve material supplied by Western Reserve University. Dr. Donaldson stressed, however, that thus far the research has been wholly anatomical, and that whether there is any physiological correlation is yet to be investigated.

Science News-Letter, November 30, 1929

Nature Ramblings

By Frank Thone

Lichens

On stumps and fallen logs, on rock, on old walls and tombstones one finds them, strange growths that seem not to belong to this planet at all, but rather to a dead world, like the moon. Grays and browns are their commonest colors, though they are sometimes corpse-white and sometimes night-black, and certain kinds achieve more positive colors, like orange-red and olive-green, though never the bright, healthy green of leaves.

Their forms are as alien as their colors: sometimes mere warty or powdery patches on the rock, sometimes a curled and crumpled scale, or a host of thickset little fingers or cups. Sometimes they trail in long witch-locks from the branches of trees:

"The murmuring pines and the hemlocks
Bearded with moss",

of which Longfellow tells, are really bearded with lichens.

Alien in shape and eerie in color, the lichens are also of a most fantastic origin. They are not single plants, but masses of two kinds of plants: a literal duality, a two-in-one and one-in-two, in the natural world. The lichen consists of a fungus growing as a parasite on one of the lowlier orders of green plants, called an alga. The alga can, and sometimes does, live without the fungus, but the fungus cannot live without the alga; and it takes the two of them together to form the lichen.

Science News-Letter, November 30, 1929

The earliest known medicinal use of cinchona bark, from which quinine comes, was in 1638, when the Countess of Chinchon, wife of the Governor of Peru, was cured of fever by its administration.

CLASSICS OF SCIENCE: Beginnings of Mental Hygiene

Psychiatry

The strange case of a man who went through experiences of delusion and mania, yet retained a clear realization after recovery of what would have helped him during these attacks, who though insane deliberately made a nuisance of himself that he might know by personal experience the discipline of the "violent ward" and the "bull pen," this book opens the eyes of its readers to what it means to be insane. The extracts below, pleading for assistance for his companions less able to communicate with the world, are the opening and closing words of the book which started the mental hygiene movement.

A MIND THAT FOUND ITSELF, An Autobiography, by Clifford Whittingham Beers. New York, 1908.

Introduction

This story is derived from as human a document as ever existed; and, because of its uncommon nature, perhaps no one thing contributes so much to its value as its authenticity. It is an autobiography, and more: in part it is a biography; for in telling the story of my life, I must relate the history of another self—a self which was dominant from my twenty-fourth to my twenty-sixth year. During that period I was unlike what I had been, or what I have been since. The biographical part of my autobiography might be called the history of a mental civil war, which I fought singlehanded on a battle-field that lay within the compass of my skull. An Army of Unreason, composed of the cunning and treacherous thoughts of of an unfair foe, attacked my bewildered consciousness with cruel persistency, and would have destroyed me, had not a triumphant Reason finally interposed a superior strategy that saved me from my unnatural self.

I am not telling the story of my life just to write a book. I tell it because it seems my plain duty to do so. A marvelous escape from death and a miraculous return to health after an apparently fatal illness are enough to make a man ask himself: For what purpose was my life spared? That question I have asked myself, and this book is, in part, an answer. Until someone tells just such a story as mine and tells it sanely, needless abuse of helpless thousands will continue. Great advances toward the intelligent and humane treatment of the insane have no doubt been made—advances so great that the majority of insane patients in this country are now treated with a consideration which amounts to kindness. But a helpless and irresponsible minority, numbering thousands, are still being subjected to abuse as brutal as any

C. W. BEERS, who founded the mental hygiene movement

ever visited on insane persons during those centuries when the strong took pleasure in torturing the weak.

That insane persons are still abused is suspected by the public at large; but direct and convincing proof of that fact is seldom presented. I am sure that the proof I now offer will ring true, and will contribute to the correction of many mistaken ideas regarding the insane and their treatment, and regarding insanity itself. In the discussion of the crude methods of treatment which now obtain, all abuses which fell under my observation will of necessity be laid bare. A former victim of these methods, I feel at liberty to attack them; and the right to do so is doubly mine as I have a remedy to offer, or at least a campaign to propose. If intelligently carried on, it will, I feel confident, largely atone for one of the blackest pages in history. As the hostages which Civilization gives to Progress, the insane are entitled to the best of treatment. Certainly they are not deserving of the worst.

The subject which I treat is not alone humanitarian. Its economic importance can hardly be overestimated. The ravages of insanity cost the world millions of dollars and thousands of lives each year. There are not fewer than two hundred thousand insane persons in our asylums, hospitals, sanatoriums, and homes. There are at least one hundred and fifty thousand mental incompetents in Great Britain, and a like number in France, and in Germany. Every civilized country has its burdensome proportion. Nor are these afflicted ones the only sufferers. It is safe to assume that each insane person has at least five relatives and friends interested in his welfare. Granting this, there are a million people in this country—one eightieth of the entire population—directly or indirectly affected by this most dreaded disease. And any one of the remaining seventy-nine millions may sooner or later be forced by Fate to join this army of distress.

In spite of the gravity of these conditions comparatively little is being done to combat the present irresistible advance of insanity. No important phase of life is so generally misunderstood; and no equally important subject is so consistently and willingly ignored by all, except the few whose paid duty it is to care for the insane. The only real fight waged against this insidious disease is being carried on in a desultory manner by a few unselfish scientists who are devoting their time to investigation, in most instances without such support as they deserve.

There is every reason to believe that many forms of insanity will finally be rendered amenable to treatment. With small-pox conquered; diphtheria doomed; yellow fever confined within limits; and tuberculosis partially controlled and not infrequently cured, why should insanity remain forever on the list of incurable diseases? Though some forms of it may continue to baffle the alienist, recognized authorities predict that most forms will in time prove curable. But the day of its even partial defeat cannot come until systematic scientific research has first done its work—a work of years. Why should such research, on a scale in keeping with the importance of the problem, be longer delayed? The fight may cost millions, but will not the eventual payment of an inevitable indemnity more than offset the cost? Even if there were no economic advantage to be gained, would not the dividend which will be added directly to the sum of human happiness be a sufficient reward? The people of this age can erect no more enduring monument to themselves than by doing that which will make it possible for posterity to regard the Twentieth Century as the century in which the cause and cure for most forms of mental diseases were discovered.

In presenting (*Turn to next page*)

Mental Hygiene—*Continued*

this book I have several definite purposes. First, I hope to rob insanity of many of its terrors —at least those which do not rightly belong to it. Most children are afraid of the dark until they learn that its hidden monsters are imaginary. But this childish fear is a sublime mental process compared with the unreasoning dread of insanity that prevails in the minds of most adults throughout the civilized world. Under certain conditions an insane person is, without doubt, the unhappiest of men, but I shall prove that sometimes he is not less happy—is indeed happier—than a sane person under the most favorable conditions. To a startling degree the unhappiness of the insane is directly due to the perhaps unconscious lack of consideration with which they are treated. This is fortunate; for these external contributory causes can be eliminated; and no one thing will go so far toward eliminating them as the universal adoption and continued use of the humane and equally scientific principle of Non-Restraint in the treatment of insanity. As the reader will come to know—doing to the insane as the sane would be done by is the essence of Non-Restraint.

Secondly: Books alone can never produce the desired results. But a society founded and endowed for the sole purpose of solving this stubborn problem can at least raise the standard of treatment to such a level that existing short-comings will be forever done away with. A campaign of education carried out under the auspices of a National Society should lead to effectual reform, make even petty abuses appear heinous, and thus insure, upon discovery, the correction of *all* abuses.

Thirdly: It is my hope that the beneficent rich may be prompted to come to the aid of the States and Nations by supplying funds for the erection and endowment of model institutions wherein mental and nervous diseases, in their incipient and curable stages, may be treated with the maximum efficiency. With such institutions—hospitals and sanatoriums —in operation, thousands of those who now are committed indiscriminately could be restored to health and society, without having suffered the unfair stigma of legal incompetence; and patients in our State Hospitals could then receive that individual treatment which will insure the recovery of so many of them and, at the same time, enable those who do not recover to lead comfortable, even happy lives. . . .

Conclusion

The field is before us! The disgrace of the facts (of which I have related but a few) still cries to Heaven. Though the days of dungeons, manacles, shackles, ropes, straps, and chains have, in the main, passed, it should yet be borne in mind that our great hospitals, with their beautiful grounds, are too often but cloaks wherewith a well-intentioned but blind civilization still covers a hideous nakedness. This cruel and deceptive cloak must be torn off. Let these mysteries be converted into open Truth and Fairness. That the public has long been deceived by appearances is not surprising. For, even I, in walking casually through the wards of such a hospital, find it well-nigh impossible to realize that many of the inmates are subjected to even mild abuse. Even I, who have suffered the most exquisite torture from "muffs" and straight-jackets (camisoles), have, in my several tours of inspection at State Hospitals, looked upon a patient so bound with a feeling rather akin to curiosity than sympathy. So innocent do these instruments of restraint appear when one views a victim for the few moments it takes to pass him by, it is little wonder that a glib-tongued apologist of "Restraint" may easily convince one that the bound patient is, in fact, better so. Nevertheless, he is not better so. The few seconds that the observer beholds him are but an infinitesimal fraction of the long hours, days or weeks, that he must endure the embrace of what soon becomes an engine of torture. There is but one remedy for the evils attending the mechanical restraint of the insane. At once and forever abandon the vicious and crude principle which makes its use possible.

The question is: Will the reader help to bring about improved conditions? If so, let him take his stand as an advocate of Non-Restraint. So will he befriend those unfortunates whose one great need may best be epitomized in these words—the words of a man who for a score of years worked among the insane in the capacity of an assistant physician, and later as superintendent of a state hospital. His simple though vital remark to me was: "After all, what the insane most need is a *friend!*"

Clifford Whittingham Beers (1876-) began his life's work on June 23, 1900. He says, "The events of that day, seemingly disastrous as then viewed, but all for the best as the issue proved, forced me along paths travelled by thousands, but comprehended by few." After the two years of madness which began on that day, Mr. Beers emerged sane and devoted to the cause of helping those most helpless of unfortunates, the insane. To this end, he started in 1908 the Connecticut Society for Mental Hygiene, and in 1909 the National Committee for Mental Hygiene. In 1918 he helped extend the work to Canada, and the next year began plans for an International Committee. The First International Congress for Mental Hygiene will meet in Washington, D. C., next spring.

Science News-Letter, November 30, 1929

How Men Learn

Psychology

How the human brain learns not to do things, which is as important a branch of education for life as learning to do other things, has been probed by experiments conducted at Cornell University by Dr. A. L. Winsor, of the Rural Education Department.

Using the procedure of collecting saliva, which the Russian physiologist, Prof. I. P. Pavlov, first used to show that a dog's mouth will water more freely when it hears a bell and associates the sound with eating, Dr. Winsor placed food before a hungry man and measured the increased flow of saliva which the sight of food caused. When the man continued to look at the food and was given no chance to eat, the saliva flow diminished. The brain had recognized that the food signal was false.

The same negative learning process occurs when a child jumps at the sound of a nearby train whistle. After hearing the whistle many times, instead of jumping more intensively his muscles no longer respond to the shrieking noise. The alarming sound is recognized as boding no harm.

From a series of experiments, Dr. Winsor concludes that psychologists have heretofore underrated the significance of the negative learning process. The law of learning assumes that repeated stimulation of the eye, ear, nerves, or glands will cause a response to become more firmly fixed. Yet repetition in many circumstances serves to decrease or inhibit the response, so that a habit is formed but it is the opposite of what would ordinarily be expected.

Science News-Letter, November 30, 1929

Are you blindly groping for words to fit your thoughts?

"What word conveys the exact shade of meaning I desire?"
"Is there a better word than the one I am using?"
"What is that word I have forgotten?"
"Is there a word in the language which expresses my thought clearly?"
"How can I avoid this constant repetition?"

STRANGE, isn't it, with all the marvelous wealth of our English language that you should find yourself groping blindly for the answers to such word questions as those above.

Strange, with a language so full of expressive words, that it should be so difficult to find the ones that express your thoughts clearly.

With more than 150 words describing various shades of beauty, or over 400 words denoting various degrees of goodness, for instance, why should it be so hard to find the best one for your purpose?

Yet it is not strange either, when you consider that dictionaries are arranged on the assumption that you know all of the more than 200,000 words in the language and seek merely their definitions—that all attempts to make the language available stopped with merely listing the words by ideas, and then not always in alphabetical order.

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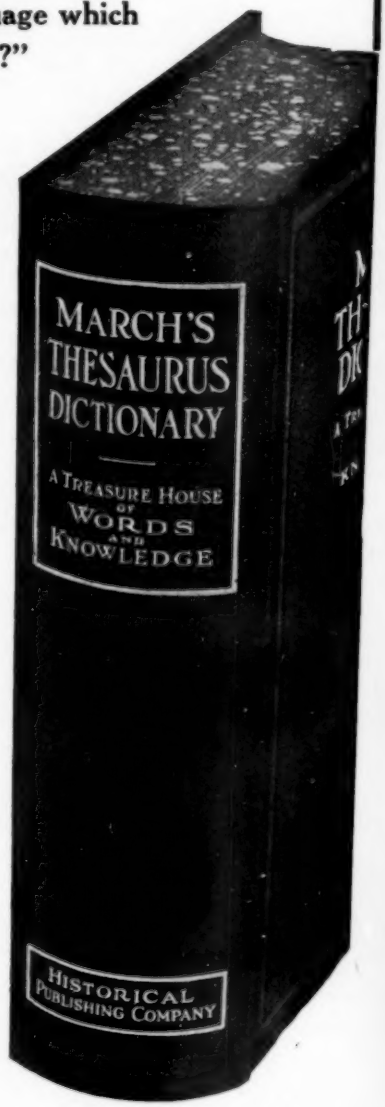

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Pharaoh's Hard Heart

Palæopathology

The Egyptian ruler Merneptah, believed to be the pharaoh who pursued the Children of Israel in their flight from bondage, never took part in that strenuous scene, because he was a fat old man with hardening of the arteries and other infirmities. Some facts about the pharaoh's condition have been generally known, but the data has not been assembled and its full significance recognized, declares Dr. Roy L. Moodie, specialist in the diseases shown in ancient bones.

Dr. Moodie, who has been making intensive studies of Egyptian mummies and the present state of knowledge about the diseases of Egypt, points out that Merneptah was an old man when he mounted the throne in the thirteenth century B. C. His mummy, although shrunken to skin and bone, shows great folds of skin about the face, neck, and hips, thus proving conclusively that the pharaoh was an excessively corpulent individual. A fringe of white hair encircled his almost bald head. The cartilages of his voice box had become bony, and his teeth were in bad condition.

When this senile ruler sent his chariots and officers out in the name of "Pharaoh" to bring back the escaping Irsaelites, he himself must have remained in his palace physically disabled to the point where any exertion was painful and continued activity impossible.

The theory that pharaoh did not ride to destruction in the Red Sea was advanced when the mummy of Merneptah first came to light in recent times. Far from being drowned, he had been buried in the valley of the royal tombs, but he had been allowed little peace in death, as in life, for robbers seeking jewels had long since broken into his tomb and chopped great holes in the royal burial wrappings. Gaping wounds were cut in the body itself. When the body was unwrapped, Prof. G. Elliot Smith, who was present, examined the hacked mummy and pointed out that the heart of this famous character was quite literally "hardened."

Sentiment against examination of the royal mummies of Egypt is now very strong. But if X-ray examination by scientists is ever allowed, further light on the Pharaoh of the Exodus may be expected, Prof. Moodie believes.

Science News-Letter, November 30, 1929

A copper carpenter's saw used in ancient Kish about 3200 B. C. was found recently.

New England Earthquake

Seismology

Earthquake observatories as far away as Victoria, B. C., and West Bromwich, England, obtained records of the earthquake that shook New England and eastern Canada on the afternoon of Monday, November 18. With the aid of seismograph records collected by Science Service from these and other stations, experts of the U. S. Coast and Geodetic Survey have determined that the center of the quake was at 47.5 degrees north latitude and 58 degrees west longitude. This is a point in the Atlantic Ocean just south of Newfoundland and about 720 miles northeast of Boston. The shake occurred there at 3:22 p. m., Eastern Standard Time.

Despite the severity of the shock, it is the first one that has ever been recorded off the Newfoundland coast, said Commander N. H. Heck, chief of the earthquake section of the Survey.

"It is not wholly surprising that one should occur in this region," he added. "The rock structure there is a continuation of a formation that has been the seat of many earthquake movements farther to the west, in Nova Scotia and the St. Lawrence valley. On February 28, 1925, a severe quake occurred in the St. Lawrence region and was felt over the northeastern United States."

The recent quake was reported by seismograph stations at Georgetown University, Washington; Fordham University, New York; St. Louis University, St. Louis; University of Michigan, Ann Arbor; University of California, Berkeley, Calif.; the Coast and Geodetic Survey, Tucson, Ariz.; the Dominion Observatory, Ottawa, Canada; the Meteorological Observatory, Victoria, B. C., and the private observatory of J. J. Shaw at West Bromwich, England.

Science News-Letter, November 30, 1929

New Theory of Space

Physics

A new idea of what fills or makes space was presented to the National Academy of Sciences by Dr. F. S. C. Northrop, associate professor of philosophy at Yale.

It is "an entity which is atomic and physical in character, and so large in size and fixed in form as to surround and congest all the microscopic atomic entities of the traditional atomic theory."

Two contradictions exist in current physical theory which can only be met by amendment to present theory, Prof. Northrop declared. A new factor to replace the discarded absolute space is needed, he argued, because atomicity is an inescapable fact and to have atomicity there must be something to refer them to other than the particles themselves.

Modern physics considers that the structure of space is conditioned by matter and that this structure is uniform over large distances. Prof. Northrop found that matter as currently conceived is incapable of producing such uniformity. According to the relativity theory of Einstein, space is the relation between objects, he stated, and the particles of the traditional atomic theory on account of their motion and change can not be the objects determining space. He has therefore postulated a sort of super-atom filling and creating space.

Science News-Letter, November 30, 1929

Used Hoofs as Trowels

Paleontology

Curious animals that once roamed the plains of Patagonia in South America and used their hoofs as digging implements were described before the National Academy of Sciences by Prof. W. B. Scott of Princeton University.

They belonged to a group known as the Entelonychia. Hitherto they have been known only from fossil skulls, but on a recent expedition E. S. Riggs of the Field Museum discovered some fairly complete skeletons, and it was from these that Prof. Scott learned of the strange modification of hoofs into digging claws. They were probably not burrowing animals, because they were much too large, but more likely used their hoof-trowels in digging up roots and tubers for food.

Another strange animal group represented in the same collections and studied by Prof. Scott were the Astrapotheria. These had a certain superficial resemblance to the elephants. The skull indicates the presence of a long proboscis, the limbs are remarkably elongate and slender in proportion, the foot is five-toed and resembles that of the elephant in appearance, though not in the details of its structure.

Both these groups of animals lived in Tertiary times, estimated at ten or twenty million years ago.

Science News-Letter, November 30, 1929

P. BLAKISTON'S SON & CO. INC. Publishers 1012 Walnut St. PHILADELPHIA

HACKH'S
Chemical Dictionary

AN entirely new work recording the phenomena of chemistry in terms of our new concepts of matter and energy.

This dictionary states clearly and precisely the theories, laws and rules of chemistry, describes the elements, compounds, drugs, minerals, vegetable and animal products, lists concisely the important reactions, processes and methods, mentions briefly chemical apparatus and equipment and includes also the collateral vocabulary of physics, astrophysics, geology, mineralogy, botany, medicine, and pharmacy, industry, mining and commerce in so far as these terms are pertinent to the field of chemistry.

The work contains a number of original charts and diagrams which should prove of great practical value. It is more than a word-book, it presents by means of numerous cross-references, encyclopedic paragraphs, etc., a cross-section of modern chemistry and brings widely scattered information into a compact, single volume.

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P. BLAKISTON'S SON & CO. INC. Publishers 1012 Walnut St. PHILADELPHIA

FIRST GLANCES AT NEW BOOKS

FIELD BOOK OF THE SKIES—William Tyler Olcott and Edmund W. Putnam—*Putnam* ($3.50). Mr. Olcott, author of several popular astronomical works, including a standard authority on stellar mythology, and his colleague have here produced a new work that deserves wide distribution. Detailed descriptions and maps of the constellations visible at different times of year, accounts of what can be seen in them with the naked eye, opera glasses, and small telescopes; information about the planets; the sun and the moon; and a chronological list of important dates in the history of astronomy are a few of the many valuable features.

Astronomy
Science News-Letter, November 30, 1929

BOYS' BOOK OF ASTRONOMY—Goodwin Deloss Swezey and J. Harris Gable—*Dutton* ($2.50). Astronomy has been relegated to such a minor place in modern schools that a new popular astronomical work for young people is most welcome. This book thoroughly and accurately covers the ground. Unfortunately, however, the text is decidedly "written down" in a manner that should always be avoided in books for young people. But the worst part of the work is the illustrations. Many of these are so crude that it seems as if a child had drawn them.

Astronomy
Science News-Letter, November 30, 1929

PHYSICS OF THE HOME—Frederick A. Osborn—*McGraw-Hill* ($3). The second edition of a text to meet the needs of women students who want to know those principles of physics which find constant application in their daily home life.

Physics
Science News-Letter, November 30, 1929

MY LIFE OF MAGIC—Howard Thurston—*Dorrance* ($2.50). One of the leading professional magicians here tells how he entered the field and some of his interesting experiences.

Legerdemain
Science News-Letter, November 30, 1929

THE MUSICIAN'S ARITHMETIC—Max F. Meyer—*Univ. of Missouri* ($1.25). A series of drill problems for an introduction to the scientific study of musical composition. According to the author, it is not "lazy reading," but intended for use "as a text under the rigorous discipline of a college class."

Music—Mathematics
Science News-Letter, November 30, 1929

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION FOR 1928—*U. S. Government Printing Office* ($2). The really sensational article on "Missing Links" by Dr. Gerrit S. Miller is but one of the 22 important scientific papers that make up the bulk of this 763 page book. Among other articles are: Jeans on "Cosmogony," Pease on "Astronomical Telescopes," Millikan and Cameron on "Cosmic Rays," Schuchert on "Continental Displacement," Wetmore on "Birds of the Past," Kellogg on "Migrations of Whales," McIndoo on "Communication among Insects" and Hrdlicka on "Neanderthal Man." Copies may also be obtained by those interested on application to the Institution.

General Science
Science News-Letter, November 30, 1929

THE STORY OF EVOLUTION—Benjamin C. Gruenberg—*Van Nostrand* ($4). A veteran teacher and writer here undertakes the many-times attempted task of writing evolution for the special benefit of the student, both him in school and him who still wishes to learn though his school days are behind him. He comes well equipped, and he has the advantage of certain new facts and concepts that have appeared since the flurry that followed the Dayton trial four and a half years ago. Dr. Gruenberg deserves special commendation for disturbing the too-easy optimism of the Victorian idea of evolutionary "progress" still popularly prevalent.

Evolution
Science News-Letter, November 30, 1929

A SOURCE BOOK IN MATHEMATICS—David Eugene Smith—*McGraw-Hill* ($5). Criticism of a book such as this is impossible, because it consists of quotations from mathematical classics from the Renaissance to the end of the Nineteenth century. All the selections are in English, those in other languages having been skilfully translated. It covers the field of number, the field of algebra, the field of geometry, the field of probability and the field of the calculus, functions and quaternions. Robert Recorde, Stevin, Pascal, Euler, Gauss, Napier, Leibniz, Newton, Galileo, Cardan, Fermat, Bernoulli, Descartes, Riemann, Lobachevsky, DeMoivre, Laplace and Hamilton are a few of the authors represented.

Mathematics
Science News-Letter, November 30, 1929

ANIMALS LOOKING AT YOU—Paul Eipper, transl. by Patrick Kirwan—*Viking Press* ($3). The German author of this book shows himself a true son of Il Poverello in his sympathetic understanding of his brothers on the other side of the cage bars. Not always on the other side, either; for he tells of happy hours spent playing with young orangs in the straw of their cage, and of his chaperonage of a youthful gorilla on a train trip. He does not make any pretense at being professionally zoological; he is much more useful than that; he shows how any average citizen can really get something out of a trip to the zoo. The many excellent photographs by Hedda Walther add much to the charm of the book.

Zoology
Science News-Letter, November 30, 1929

DOWN IN THE GRASS—Harold Kellock—*Coward-McCann* ($2). The story of a little boy who by magic became so small he could walk about among the insects. Necessarily a good deal anthropomorphized, the six and eight-legged folk in this tale nevertheless retain essentially their own characters, and the book thus manages to deal out considerable entomological information in sugar-coated doses.

Entomology
Science News-Letter, November 30, 1929

FORESTS AND MANKIND—C. L. Pack and T. Gill—*Macmillan* ($3). This book combines a clear and exceedingly readable exposition of the importance of forests and their products to the human race with vigorous propaganda for conservation and reforestation in the United States. The numerous well-thought-out diagrammatic illustrations add a good deal to its "punch."

Forestry
Science News-Letter, November 30, 1929

CATALOGUE OF BIRDS OF THE AMERICAS, Part VI—C. E. Hellmayr—Field Museum. This volume, constituting Publication 266 of the Field Museum, deals with the Oxyruncidae, Pipridae, Cotingidae, Rupicolidae and Phytotomidae.

Ornithology
Science News-Letter, November 30, 1929

DOWN THE WORLD'S MOST DANGEROUS RIVER—Clyde Eddy—*Stokes* ($2.50). An impressionistic account of an adventurous descent of the Colorado River.

Geography
Science News-Letter, November 30, 1929

First Glances at New Books—*Continued*

ANIMAL LOVER'S KNAPSACK—Edited by E. O. Grover—*Crowell* ($2.50). This is a most catholic kind of an anthology, in praise of all kinds of animals: dogs, cats, donkeys, deer, crows, nightingales, toads and grasshoppers. All manner of pets are represented, and all times and nations. The book should do nicely as a Christmas gift.

Zoology
Science News-Letter, November 30, 1929

OUTLINE OF BACTERIOLOGY—H. A. Bartels—*W. A. Broder* ($2). A very much condensed introduction to bacteriology, adapted for use in technical courses that do not permit time for more extended instruction.

Bacteriology
Science News-Letter, November 30, 1929

BRYOZOA OF THE PHILIPPINE REGION—Ferdinand Canu and Ray S. Bassler—*Government Printing Office* ($1.50). A comprehensive monograph, of interest to students of marine zoology. This publication constitutes Bulletin 100, Volume 9, of the Smithsonian Institution.

Zoology
Science News-Letter, November 30, 1929

OÖLITES OR CAVE PEARLS IN THE CARLSBAD CAVERNS—F. L. Hess—*Government Printing Office.* This issue of the proceedings of the U. S. National Museum contains a brief description of curious and beautiful deposits found in one of the new wonders of the Southwest.

Geology
Science News-Letter, November 30, 1929

A LABORATORY MANUAL OF HISTORICAL GEOLOGY—Kirtley F. Mather and Carey G. Croneis—*Harvard University Press* ($2). A loose-leaf laboratory manual prepared especially for students in "Geology 5" at Harvard, but equally applicable in any institution where a course is given that, like this one, "involves a survey of the known and inferred history of the earth and its inhabitants during geologic time."

Geology
Science News-Letter, November 30, 1929

NEW LABORATORY EXPERIMENTS IN PRACTICAL PHYSICS—N. Henry Black—*Macmillan* ($1.12). A new edition of the laboratory manual to accompany Black and Davis' "New Practical Physics." The number of experiments has been increased from sixty-five to seventy-one in order to give the instructor greater latitude in selecting experiments to suit his needs.

Physics
Science News-Letter, November 30, 1929

PRACTICAL CHEMISTRY—L. C. Newell—*Heath* ($1.48). A revised new edition of a successful textbook for a general chemistry course. It contains, in addition to the regular text, an ample second part outlining 239 laboratory experiments and tests.

Chemistry
Science News-Letter, November 30, 1929

ARTIFICIAL SILK—O. Faust, transl. by Ernest Fyleman—*Pitman* ($3). This is a complete but compact discussion of the machines and processes used in the production of the latest and most successful invader of the textile field. It will be of use and interest to chemists and technologists as well as to those interested in the actual manufacture of rayon.

Textiles
Science News-Letter, November 30, 1929

FRENCH WORD BOOK—George E. Vander Beke—*Macmillan* ($1.00). One of the many useful publications of the American and Canadian Committees on Modern Languages. Words are arranged in the order of their importance, based on the frequency with which they appear in a variety of French books and newspapers. The volume should be of great assistance to the French teacher and student. The English equivalents of the words are not given, however.

Language
Science News-Letter, November 30, 1929

THE BUREAU OF THE CENSUS—W. Stull Holt—*The Brookings Institution* ($1.50). This volume is prepared by the Institute for Government Research as No. 53 of the Service Monographs of the United States Government. A rather comprehensive discussion of the history, activities, and organization of a very useful government bureau.

Civics
Science News-Letter, November 30, 1929

REACHING OTHER MINDS—Davida McCaslin—*Knopf* ($1.75). A book on English composition for college students which deals more with the spirit than with the form of writing.

Literature
Science News-Letter, November 30, 1929

CAPITAL AND LABOR—John A. Fitch—*American Library Association* (35c). Number 48 of the excellent series "Reading With a Purpose." It introduces several books which will help the reader to increase his understanding of industrial problems.

Industry
Science News-Letter, November 30, 1929

MODERN CHINESE CIVILIZATION—A. F. Legendre—*Cape and Smith* ($2.75). Beyond the coast cities with which Europeans are familiar lies another China, primitive almost beyond our imagining. Dr. Legendre, who was director of the Imperial School of Medicine at Chengtufu, lived in this interior for twenty years. He has painted a devastating picture of the actual conditions there. The book reads easily and does much to explain the apparently hopeless political and social tangle in China. The translation from the French is by Elsie Martin Jones.

Sociology
Science News-Letter, November 30, 1929

GREEK MEDICINE—Arthur J. Brock—*Dutton* ($1.75). Extracts from the works of the chief Greek medical writers from Hippocrates to Galen are presented, most of the translations from the original being made by Dr. Brock. The book is one in the "Library of Greek Thought" edited by Ernest Barker. The present revival of interest in medical history has brought forth many books on the subject, but this one is particularly valuable because it enables the layman to read for himself the very words of the "Father of Medicine" and his successors. The extracts are furnished with brief critical and explanatory notes.

Medicine
Science News-Letter, November 30, 1929

PLANNING A CAREER—L. W. Smith and G. L. Blough—*American Book Co.* ($1.44). A text-book attempting to give public school students an outline of each of the many occupations which may be open to them. The discussion of each of the vocations and professions is necessarily somewhat superficial, but the book should serve to stimulate the interest of young people in planning a career.

Education
Science News-Letter, November 30, 1929

STUDIES IN SERVICE AND SELF-CONTROL—Hugh Hartshorne, Mark A. May, and Julius B. Maller—*Macmillan* ($2.75). To analyze single single types of behavior the authors have conducted controlled experimental studies, devised and given tests to many school children, and gathered quantities of statistics. Sorting out the significant facts and implications, the psychologists present new data on the connection between character and age, intelligence, physical condition, and environment.

Psychology
Science News-Letter, November 30, 1929

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